age of patients 59.6 years, was average 43.7 ml and it was lower than the normal cerebral circulation time of focus cerebral hemispheric cranium was 11.3 sec. and it was appreciably prolonged as compared with normal cerebral hemispheric cavities circulation time.

Cererbal Hemodynamics Study by an Intravenous Injection of Radioisotope

T. HIROTA

First Department of Surgery, Nagoya University, School of Medicine, Nagoya

K. USUI, T. ASAI, M. HARA, O. SATO and H. SAITO

Radioisotope Laboratory, Nagoya University Hospital, Nagoya

In addition to the brain transit time measurement, the cerebral circulation curves obtained by intravenous injection of a radioisotope were studied and analysed in the flolowing ways, expecting to obtain the cerebral hemodynamics in more detail.

(1) Simultaneous recording of a radioaortogram through a gamma-ray detector placed over the sternum. The ratio of the height of aortic peak(P) to that of the bottom of downward slope(H) and the time interval between P and H give an estimation of the density and width of the bolus before entering the head. Thus, any eventual cardiopulmonary abnormality, which, of itself, results in the deformed bolus, could be detected.

(2) The measurement of the time between the aortic peak and the peak of the cerebral circulation curve on each side was made. This aorta-to-peak time indicates the symmetry or asymmetry of the cerebral circulation.

(3) The ratio of the height of the peak on the cerebral criculation curve to that of the bottom of downward slope was then calculated. This will be lowered on the side where arterio-venous shunt (partial), irregular blood flow, decreased blood flow or increased blood pool is present. One case of severe head injury resulted in the development of right carotid-cavernous sinus fistula showed an increase of this value of that side. This was considered due to almost complete blood flow through the shunt.

(4) Observation of the deformed peaks on the cerebral circulation curves. This indicates the presence of the irregular inflow and/or outflow of the bolus in the cranium, caused by the intracranial vascular abnormalities as well as any cardiopulmonary abnormalities.

(5) On the cerebral circulation curve, the widths of the curve at 1/2 and 2/3 of the height of peak were respectively measured. The latter was observed to be well correlated with the brain transit time, while the former with the radioaortogram.

(6) Finally, cases, in which the results of the above mentioned analysis correlated with the results of the cerebrla blood flow measurement from the ^{85}Kr clearance curve, were presented and discussed.

This simple and atraumatic testing of cerebral circulation will give useful and accurate information of clinical value as to the cerebral hemodynamics if above mentioned analysis is employed.